

## REMARKS

### **I. History and Current Status of Claims.**

Claims 1-32 were originally presented for examination before the United States Patent and Trademark Office (the "Office") with filing of a patent application on July 7, 2001. The first Office Action provides the following: objection to Claims 17 and 21 because of informalities; rejection of Claims 1, 3-7, 9, 10-12, 14 and 16 under 35 U.S.C. § 102(b) as being anticipated by Pinnock (WO 99/39169 A1); rejection of Claims 8, 13 17-19 and 22-32 under 35 U.S.C. §103(a) as being unpatentable over Pinnock in view of Burke, Jr (US 3,688,570). rejection of Claims 2 and 15 under 35 U.S.C. §103(a) as being unpatentable over Pinnock in view of Cui et al (US No. 6,115,111); and rejection of Claims 20 and 21 under 35 U.S.C. §103(a) as being unpatentable over Pinnock as modified by Burke, Jr further in view of Cui et al. In his response to the first office action, Applicant cancelled claims 2, 15 and 20 and amended claims 1, 11, 17, 19 and 22. Claims 1, 3-14, and 16-19, and 21-32 remained pending in the present application.

In the most recent Office Action, made Final, all the claims, 1, 3-7, 9-12, 14 and 16 are being rejected under 35 U.S.C. §103(a) as being unpatentable over Pinnock in view of Cui, and claims 8,13,17-19 and 21-32 are being rejected under 35 U.S.C. §103(a) as being unpatentable over Pinnock in view of Cui and Bruke. In response, Applicant amended claims 1, 3, 4, 7, 8, 11, 17, and 24 and submits the following remarks with a Request for Continued Examination (RCE).

### **II. Rejection of Claims 1, 3-7, 9-12, 14 and 16 as being unpatentable over Pinnock in view of Cui.**

Claims 1, 3-7, 9-12, 14 and 16 currently stand rejected by the Office under 35 U.S.C. §103 as being obviated by Pinnock in view of Cui. Claims 1 and 11 have been amended to correct a misspelling of "vertical: and to provide additional language from the specification that clarifies how Applicant's invention is novel and nonbvious over the cited art.

Pinnock does not teach or suggest a method for analyzing the performance of a system that includes a step of: directing light from at least one vertical cavity surface-emitting laser (VCSEL) to an encoded portion of a rotating member. Pinnock merely utilizes a lamp, which is not conducive for use in small-scaled environments or with as much lighting efficiency as a collimated laser such as a VCSEL. By not teaching laser use, Pinnock fails to teach each and every element of the invention as provided by Applicant in independent claims 1 and 11.

The Cui reference only teaches use of a vertical cavity surface emitting laser (VCSEL) as an optical rotary position encoder. One skilled in the art would not be motivated by Cui to combine a VCSEL with Pinnock et al to provide a method for analyzing the performance of a system that includes a step of directing light from at least one vertical cavity surface-emitting laser (VCSEL) to an encoded portion of a rotating member. The Examiner does not point to specific language in either reference that would hints at or suggests a combination what would perform as claimed by applicant.

Applicant has amended claims 1 and 11. Claim 1 and 11 now read as follows:

1. A method for analyzing the performance of a system, comprising the steps of:

directing light from at least one vertical cavity surface-emitting laser (VCSEL) towards identically encoded portions formed on planar surfaces formed on and located near inner surfaces of two disks independently rotatable on two shafts representing input and output mechanism of the sytsem;

transmitting a portion of the light towards a detector from said encoded portions;

detecting a transmitted portion of the light using the detector; and

recovering information from said transmitted portion of the light, said information containing performance characteristic data of said system including torque between the two shafts.

11. An apparatus for analyzing the performance of a system including two rotating disks independently attached to facing end of input and output shafts

and a torsion bar interconnecting the input and output shafts, said apparatus comprising:

at least one directing element that directs light from a vertical cavity surface-emitting laser (VCSEL) in order to intercept an encoded portion of said disks;

at least one transmitting element associated with said encoded portion that transmits a transmitted portion of said light from said encoded portion of said rotating members; and

at least one detector that detects the transmitted portion of said light to recover performance information maintained therein, wherein said performance information includes data about torque between the input and output shafts.

Neither Pinnock or Cui teach or suggest placement of encoded portions on the inner surfaces of two rotating members (i.e., disks). Neither Pinnock or Cui hint or suggest that the combination should or can be made, nor that such a combination would provide an apparatus where a light beam from a single light source such as a laser can impinge on two encoded surfaces causing images to interact. According to applicants claims, the images are used to detect system performance such as torque between the rotating members or associated hardware. Because neither Pinnock or Cui teach, suggest, or motiveate one skilled in the art to provide the invention as now claimed by Applicant, the rejection is respectfully traversed.

Claims 17-19 and 21-32 currently stand rejected by the Office under 35 U.S.C. §103(a) as being unpatentable over Pinnock in view of Cui et al and Burke Jr. Independent claim 17 has been amended as follows:

17. An apparatus for detecting the relative motion between at least two rotating members in a system having a vertical cavity surface-emitting laser (VCSEL) for generating a light beam, said apparatus comprising:

a first encoded portion located on a surface of a first rotating member, said first encoded portion facing a second encoded portion located on a surface of a second rotating member, said first and second encoded portions used for the transmission of images created using said light beam; and

a detector for detecting Moirè fringes formed as a result of the interaction of the images from said first and second encoded portions of said first and second rotating members, wherein said detector is located proximate to said system.

Burke et al or Cui et al cannot be used in combination with Pinnock indicated by Examiner to obviate Applicant's invention as now claimed. Pinnock, Cui and Burke Jr combined fail to teach or suggest a system as embodied in claim 17, which include use of a vertical cavity surface emitting laser to illuminate facing surface of two independently rotating members.

### III. Conclusion

Applicant respectfully submits that the amendments to claims 1, 3, 4, 7, 8, 11, 17, and 24 submitted May 3, 2004 together with his remarks overcome prior rejections rendered by the Office. Accordingly, Applicant respectfully request request timely issuance of the present RCE application into a patent.

The Examiner is respectfully requested to contact the undersigned representative to conduct an interview in an effort to expedite prosecution in connection with the present application should there be any outstanding matters that need to be resolved.

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